

Metastasis to the Sinonasal Tract from Sigmoid Colon Adenocarcinoma

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Abstract

Introduction: Metastatic adenocarcinoma from the gastrointestinal tract to the sinonasal tract is rare. The histological morphology of this lesion is indistinguishable from the colonic variant of primary sinus adenocarcinoma or intestinal-type adenocarcinoma (ITAC). **Clinical Picture:** This is a report of a case of metastatic adenocarcinoma of colorectal origin to the paranasal sinuses in a 52-year-old female who was previously treated for adenocarcinoma of the sigmoid colon. A histologic study of the surgical specimen from the sinonasal cavity demonstrated a tumour identical to the patient's prior primary tumour of the colon. The sinonasal neoplastic tissue showed marked positivity for carcinoembryonic antigen and expressed cytokeratin 20, which differentiates metastatic colonic adenocarcinoma from ITAC. **Treatment/Outcome:** The patient received palliative radiation but died 3 months after the diagnosis. **Conclusion:** Distinguishing metastatic adenocarcinoma from gastrointestinal tract from ITAC can be difficult. In view of the resemblance, immunohistochemical staining can help in differentiating them. It is important to recognise these as metastatic lesions as the treatment is mainly palliative.

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Key words: Cytokeratin 20, Intestinal-type adenocarcinoma, Sinonasal metastatic adenocarcinoma

Case Report

A 52-year-old female was diagnosed with well-differentiated adenocarcinoma of the sigmoid colon in 1999. An anterior resection was performed followed by adjuvant chemotherapy for 6 cycles. Last surveillance colonoscopy in April 2003 revealed normal morphology. In November 2003, she complained of swelling and numbness over the right cheek for 3 months duration, associated with right nasal obstruction, epistaxis, anosmia, loosening of the upper teeth and headache. Vision of the right eye had deteriorated during that period. There was significant loss of weight of 9 kilograms within 3 months.

Examination showed right cheek swelling with normal overlying skin. There was a friable mass filling the right nasal cavity arising from the lateral nasal wall pushing the septum to the left. There was proptosis, chemosis, complete ophthalmoplegia of the right eye with no perception of light.

Oral cavity examination showed a fungating mass over the right gingivobuccal sulcus and hard palate. There was no trismus and no neck nodes were palpable. Serum carcinoembryonic antigen (CEA) was markedly raised. Computed tomographic (CT) scan showed a large soft tissue mass in the right maxillary sinus with an extension to the ethmoidal, frontal and sphenoidal sinuses. There was erosion of the medial wall of orbit with an extension into the right orbital contents. There was no clear demarcation between this lesion and the medial rectus muscle. The base of the skull was eroded with an extension into the anterior cranial fossa (Fig. 1). Chest x-ray showed multiple cannonball lesions. Biopsy of the right nasal mass was reported as metastatic well-differentiated adenocarcinoma of colorectal origin. The cells exhibited pleomorphic, hyperchromatic nuclei with prominent nucleoli. Immunohistochemically, the malignant cells were positive for cytokeratin 20 (Fig. 2) and negative for cytokeratin 7

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(Fig. 3). The cells also showed marked positivity for CEA (Fig. 4) and p53 while they were negative for neuron-specific enolase (NSE). The slides from the resected sigmoid colon were also reviewed and showed similar morphological features of well-differentiated adenocarcinoma. This patient received palliative radiation but died 3 months after the diagnosis.

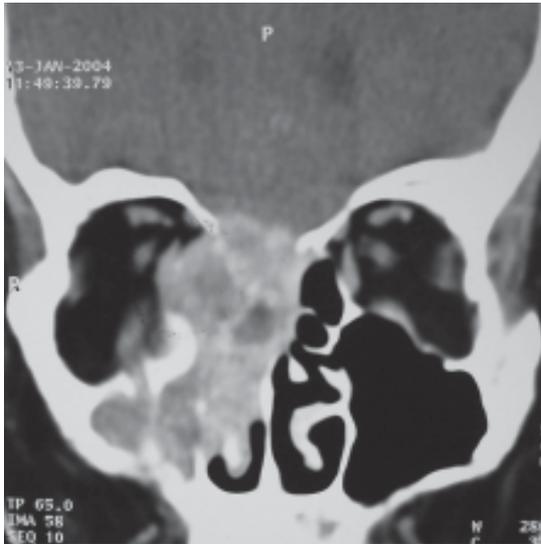


Fig. 1. The base of the skull was eroded with extension into the anterior cranial fossa.

Discussion

Primary adenocarcinoma of the nose and paranasal sinuses is rare. The overall incidence probably accounts for 10% to 20% of all sinonasal malignancy.¹ Many of these are of salivary gland origin, but others are less familiar and have histologic patterns similar to those of adenocarcinoma of the colon. These latter ones have been named intestinal-type adenocarcinoma (ITAC) and are responsible for less than 4% of the total malignancies in this region.²

Metastatic tumours to the nasal cavity and paranasal sinuses are far less common. They are reported to occur in patients aged between 50 and 70 years of age.³ The clinical picture of metastatic lesions is similar to that of primary sinonasal malignancy. Hypernephroma accounts for the majority⁴ while isolated cases have also been reported from the bronchus,⁵ breast,⁶ colon,^{5,7} stomach,^{5,8} prostate,⁹ thyroid and malignant melanoma.⁵ The sites of involvement were maxillary sinus 50%, ethmoid sinus 19%, frontal sinus 16%, nasal cavity 10% and sphenoid sinus 5%.⁵

The mechanism of tumour spread to the paranasal sinuses was postulated by Batson in 1940.⁵ He demonstrated that the vertebral venous plexus which consisted of epidural and prevertebral veins with innumerable inter-twining vessels that communicate at every somite level with either

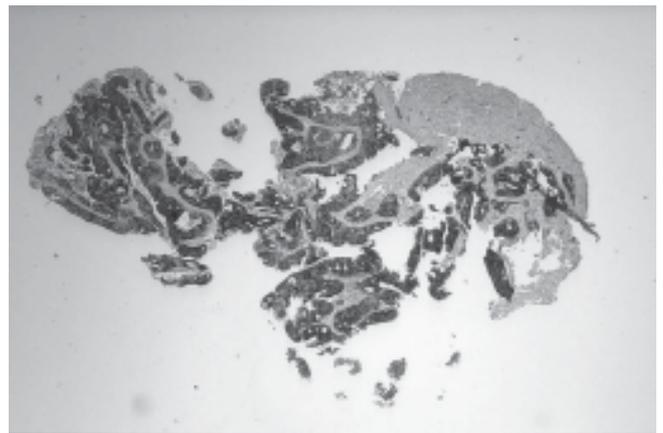


Fig. 2. Immunohistochemically the malignant cells were positive for cytokeratin 20.

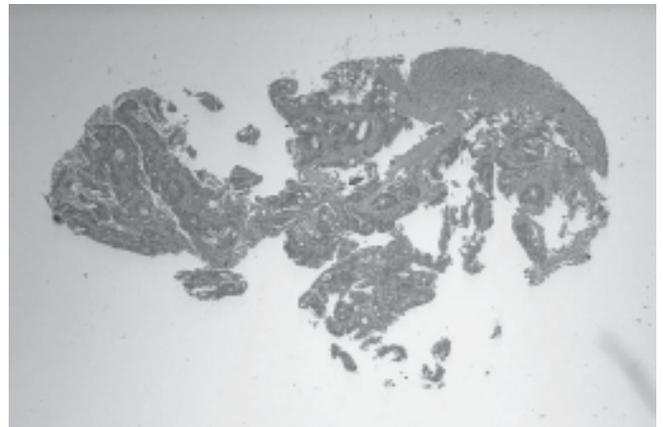


Fig. 3. Immunohistochemically the malignant cells were negative for cytokeratin 7.

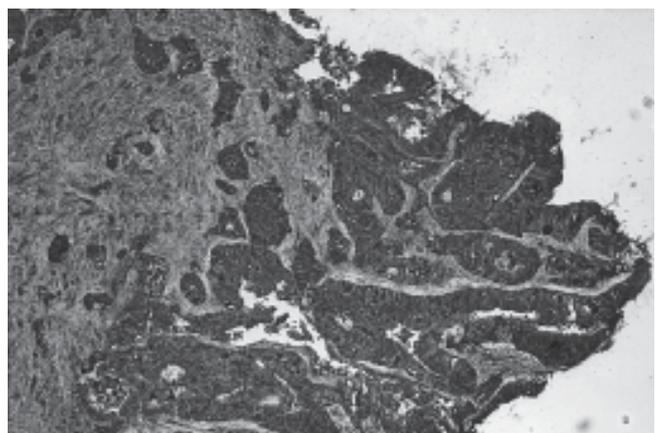


Fig. 4. The cells showed marked positivity for CEA.

the intercostals veins, the vena cavae, the azygous system or the pelvic veins, had extremely low pressure and were valveless. The metastatic cells could travel upwards to the head via the pterygoid plexus, cavernous sinus and pharyngeal plexus. By retrograde spread, tumours could reach the nose and paranasal sinuses especially during

increased intrathoracic or abdominal pressure. In our patient, metastasis to the lung was also detected, suggesting the latter could be the route of metastasis.

The most common sites for colon cancer metastasis are the regional lymph nodes, the liver, the lung and the peritoneum. It is important to differentiate ITAC from adenocarcinoma of intestinal origin metastatic to the sinonasal cavity because it will influence on the management approach. The optimal treatment for sinonasal ITAC is complete surgical resection with adjuvant radiation therapy¹⁰ while the treatment of metastatic disease is palliative, with radiation, surgery or chemotherapy to relieve obstructive and compressive symptoms or pain.

Histologically, colonic adenocarcinoma has a striking resemblance to ITAC.¹¹ Distinction of ITAC from adenocarcinoma of intestinal origin metastatic to the sinonasal cavity may be extremely difficult on histologic grounds alone. In view of the resemblance, differential immunohistochemical staining of the 2 tumour types needs to be carried out.¹² The co-ordinated expression of cytokeratin, CK7 and CK20 may be helpful in differentiating metastatic colonic adenocarcinomas and ITAC.¹³ CK7 is a Type II basic keratin found in the glandular epithelium of a wide variety of organs,¹³ and generally originates from the breast, urinary bladder, female genital tract, lungs or pancreatobiliary tract. In contrast, CK20 is the acidic Type I keratin restricted to tumours of colonic, pancreatic and gastric origins. The CK20+/CK7- immunoprofile is considered specific for colorectal epithelial tumours.¹⁴ The majority of colonic adenocarcinomas expressed CK20 and non-colorectal adenocarcinomas expressed CK 7.¹³ The sinonasal ITAC also lacked strong CEA expression and were more likely to display neuroendocrine differentiation than colonic adenocarcinomas. A strongly positive CEA staining in a sinonasal adenocarcinoma increases the likelihood of a metastatic tumour.¹² In our case the neoplastic tissue showed marked positivity for CK20 and CEA while it was negative for CK7 and NSE. The tissues from the resected colonic carcinoma were also reviewed and showed similar appearance histologically.

Diagnosis of metastatic tumours to the sinonasal tract is often delayed. The tumour usually involves multiple sinuses at presentation.¹ In our case, the tumour had involved multiple sinuses with intracranial and orbital extension at presentation. In the advanced stage, the treatment is mainly palliative radiotherapy and/or chemotherapy. The prognosis of metastatic disease in the nose and paranasal sinuses is uniformly poor.¹⁵ Death within a few months of diagnosis is typical though long-term survival has been reported.¹⁶ The survival rate has been reported to range from 3 weeks to 52 months.¹⁷ In our case, the patient died 3 months after diagnosis.

Conclusion

As this case has demonstrated, distinction of adenocarcinoma of intestinal origin metastatic to the sinonasal cavity from ITAC may be extremely difficult on histological grounds alone. When a differential diagnosis between colonic metastasis and ITAC has to be carried out, immunohistochemical testing should be performed.

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